AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method, comprising:

designing a TEQ (Time EQualizer) in a DMT (Discrete Multi-Tone) system to improve throughput performance by:

selecting an eigenvector with a subspace-based design method; and

computing TEQ filter coefficients with the eigenvector; and

reducing the number and severity of notches that the TEQ introduces in a transfer function of a shortened main channel in the DMT system.

2. (Canceled)

3. (Currently Amended) The method of claim [[2]]1, wherein designing the TEQ further comprises using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) method.

4. (Currently Amended) The method of claim [[2]]1, wherein designing the TEQ further comprises using a MinISI (Minimum Inter-Symbol Interference) method.

5. (Currently Amended) The method of claim [[2]]1, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

6. (Currently Amended) The method of claim [[2]]1, wherein selecting the eigenvector comprises maximizing the achievable bitrate over a subspace of eigenvectors.

7. (Original) The method of claim 6, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

8. (Original) The method of claim 1, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

9. (Canceled)

10. (Original) The method of claim 8, wherein designing the TEQ further comprises using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) method.

11. (Original) The method of claim 8, wherein designing the TEQ further comprises using a MinISI (Minimum Inter-Symbol Interference) method.

12. (Original) The method of claim 8, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

13. (Original) The method of claim 8, wherein selecting the eigenvector comprises maximizing the achievable bitrate over a subspace of eigenvectors.

14. (Original) The method of claim 13, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

15. (Currently Amended) A system, comprising:

means for designing a TEQ (Time EQualizer) in a DMT (Discrete Multi-Tone) system to improve throughput performance including:

means for selecting an eigenvector with a subspace-based design method; and

means for computing TEQ filter coefficients with the eigenvector; and

means for reducing the number and severity of notches that the TEQ introduces in a transfer function of a shortened main channel in the DMT system.

16. (Canceled)

17. (Currently Amended) The system of claim [[16]]15, wherein the means for designing the TEQ further comprises means for using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) system.

18. (Currently Amended) The system of claim [[16]]15, wherein means for designing the TEQ further comprises means for using a MinISI (Minimum Inter-Symbol Interference) system.

19. (Currently Amended) The system of claim [[16]]15, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

20. (Currently Amended) The system of claim [[16]]15, wherein means for selecting the eigenvector comprises means for maximizing the achievable bitrate over a subspace of eigenvectors.

21. (Original) The system of claim 20, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

22. (Original) The system of claim 15, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

23. (Canceled)

24. (Original) The system of claim 22, wherein designing the TEQ further comprises means for using a MSSNR (Maximum Shortening Signal-to-Noise Ratio) system.

25. (Original) The system of claim 22, wherein means for designing the TEQ further comprises means for using a MinISI (Minimum Inter-Symbol Interference) system.

26. (Original) The system of claim 22, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

27. (Original) The system of claim 22, wherein means for selecting the eigenvector comprises means for maximizing the achievable bitrate over a subspace of eigenvectors.

28. (Original) The system of claim 27, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

29. (Currently Amended) A computer readable medium, having stored thereon computer-readable instructions, which when executed in a computer system, cause the computer system to:

design a TEQ (Time EQualizer) in a DMT (Discrete Multi-Tone) system to improve throughput performance by:

selecting an eigenvector with a subspace-based design computer readable medium; and

computing TEQ filter coefficients with the eigenvector; and

reduce the number and severity of notches that the TEQ introduces in a transfer function of a shortened main channel in the DMT system.

30. (Canceled)

31. (Currently Amended) The computer readable medium of claim [[30]]29, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MSSNR (Maximum Shortening Signal-to-Noise Ratio) computer readable medium.

32. (Currently Amended) The computer readable medium of claim [[30]]29, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MinISI (Minimum Inter-Symbol Interference) computer readable medium.

33. (Currently Amended) The computer readable medium of claim [[30]]29, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

34. (Currently Amended) The computer readable medium of claim [[30]]29, further having stored thereon computer-readable instructions, which when executed in the computer system to select the eigenvector, cause the computer system to maximize the achievable bitrate over a subspace of eigenvectors.

35. (Original) The computer readable medium of claim 34, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that is comparable in magnitude to a maximum eigenvalue.

36. (Original) The computer readable medium of claim 29, wherein the TEQ design is used in a multiline communications system having multiple twisted copper pairs as a single multiline communications channel, and physical-layer signals coordinated across multiple transmitters and/or across multiple receivers for the purpose of minimizing interference noise from external sources, such as crosstalk noise from other high-bitrate services operating in a common binder or adjacent binders.

37. (Canceled)

38. (Original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MSSNR (Maximum Shortening Signal-to-Noise Ratio) computer readable medium.

39. (Original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to design the TEQ, cause the computer system to use a MinISI (Minimum Inter-Symbol Interference) computer readable medium.

40. (Original) The computer readable medium of claim 36, wherein the eigenvector used to compute the TEQ filter coefficients does not correspond to a maximum eigenvalue.

41. (Original) The computer readable medium of claim 36, further having stored thereon computer-readable instructions, which when executed in the computer system to select the eigenvector, cause the computer system to maximize the achievable bitrate over a subspace of eigenvectors.

42. (Original) The computer readable medium of claim 41, wherein the subspace of eigenvectors has a basis of eigenvectors corresponding to a set of eigenvalues that are comparable in magnitude to a maximum eigenvalue.

43. (Currently Amended) A method of processing a received DMT symbol that is preceded by a prefix and does not include a suffix, the method comprising:

extracting a last portion of a prefix symbol;

shaping a prefix with a prefix window to create a shaped prefix;

shaping a DMT symbol that does not include a suffix with a DMT window to create a shaped DMT symbol; and

combining the shaped DMT symbol and the shaped prefix,

wherein the combined shaped DMT symbol and shaped prefix generate a full rectangle symbol with a length less than or equal to a boundary prefix length.

44. (Currently Amended) A method of processing a received DMT symbol that has not been windowed for transmission, the method comprising:

extracting a last portion of a prefix symbol;

shaping a prefix with a prefix window to create a shaped prefix;

shaping a DMT symbol that has not been windowed for transmission with a DMT window to create a shaped DMT symbol; and

combining the shaped DMT symbol and the shaped prefix,

wherein the combined shaped DMT symbol and shaped prefix generate a full rectangle symbol with a length less than or equal to a boundary prefix length.